

**Listing of the Claims:**

1. (Currently Amended) Device for cultivating cells in liquid columns on a millilitre scale, having a container for receiving a liquid culture suspension of the cells, an agitation system for mixing the culture suspension in the container about a mixing axis, characterised in that at least one of the container ~~and/or~~ and the agitation system are configured in such a manner that the flow velocity is modified at least one of locally ~~and/or~~ and temporally along a streamline or flow line about the agitation axis.

2. (Currently Amended) Device according to ~~the preceding~~ claim 1, characterised in that at least one of the container ~~and/or~~ and the agitation system are configured in such a manner that, by means of the agitation system, conveyance of the culture suspension which is directed from the suspension surface to the base of the container is effected.

3. (Currently Amended) Device according to ~~the preceding~~ claim 2, characterised in that the conveyance of the culture suspension has a component which is axial with respect to the mixing axis.

4. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 1, characterised in that the inner walls of the container which enclose the culture suspension have, below, at least one of ~~and/or~~ and above the rotational plane of the agitation system, a non-rotationally symmetrical form.

5. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 1, characterised in that the inner walls of the container which enclose the culture suspension form, below at least one of in ~~and/or~~ and above the rotational plane of the agitation system, a polygon, preferably with four, five, six or more corners.

6. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 1, characterised in that the rotational axis of the agitation system is disposed off-centre or ~~eccentrically~~ eccentrically in the container with respect to the inner walls of the container which enclose the culture suspension.

7. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 1, characterised in that at least one baffle is disposed on the inner wall of the container along the circumference of the agitation system.

8. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 1, characterised in that one, two, three, four or more baffles are disposed along the inner wall of the container, at a spacing, advantageously at a uniform spacing, relative to each other.

9. (Currently Amended), Device according to ~~one of the preceding claims~~ claim 7, characterised in that the baffle or baffles is or are disposed at least one of below, in ~~and/or~~ and above the rotational plane of the agitation system.

10. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 7, characterised in that the agitation system and the baffle are disposed at a minimum gap spacing relative to each other of 0.05 mm to 20 mm, preferably 0.1 mm to 3 mm.

11. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 1, characterised in that the container is a flask, a reagent glass or a cavity of a microtitre plate or of another plate which is provided with cavities.

12. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 1, characterised in that the agitation system is at least one of magnetically positioned ~~and/or~~ and driveable.

13. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 1, characterised in that the agitation system is mounted or not mounted.

14. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 7, characterised in that the agitation system is mounted via a shaft and, if necessary, is driveable via the shaft.

15. (Currently Amended) Device according to ~~the preceding~~ claim 14, characterised in that the shaft and the baffle or baffles are configured in one piece.

16. (Currently Amended) Device according to ~~one of the claims claim 6 to 9, 13 and 14~~, characterised in that the shaft and the baffle or baffles is or are insertable into the container.

17. (Currently Amended) Device according to ~~one of the claims claim 14 13 to 16~~, characterised in that the shaft protrudes into the container from above.

18. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 14, characterised in that the shaft is enlarged at its lower end or has a flange.

19. (Currently Amended) Device according to ~~one of the claims~~ claim 14 ~~13 to 18~~, characterised in that the shaft is configured as a solid material shaft or as a hollow pipe.

20. (Currently Amended) Device according to ~~one of the preceding claims~~ claim 14, characterised in that the shaft is configured as a hollow pipe and a nozzle is disposed on its end which is open at the bottom.

21. (Currently Amended) Agitation system having a basic body which, in operation, has an upper side and an underside, characterised in that, in the basic body, at least one first through-channel is disposed, the first opening of which is situated at least partially on the underside of the basic body and the second opening of which is situated on at least one of the upper side ~~and/or~~ and laterally on the basic body.

22. (Currently Amended) Agitation system according to ~~the preceding~~ claim 21, characterised in that, in the basic body, at least one first boring is disposed as first through-channel, the passage axis of which boring includes an angle  $\alpha$  with  $0^\circ \leq \alpha < 90^\circ$  with ~~the~~ a rotational axis of the agitation system, said angle opening to the upper side of the agitation system.

23. (Currently Amended) Agitation system according to ~~one of the two preceding claims~~ claim 21, characterised in that, in the basic body, at least one further second through-channel is disposed, the first opening of which is situated at least partially on the upper side of the basic body and the second opening of which is situated on at least one of the underside ~~and/or~~ and laterally on the basic body.

24. (Currently Amended) Agitation system according to ~~the preceding~~ claim 23, characterised in that, in the basic body, at least one second boring is disposed as second through-channel, the passage axis of which boring

includes an angle  $\alpha$  with  $0^\circ \leq \alpha < 90^\circ$  with the rotational axis of the agitation system, said angle opening to the underside of the agitation system.

25. (Currently Amended) Agitation system according to ~~one of the two preceding claims~~ claim 23, characterised in that at least one of the first and the second through-channel intersect ~~and/or~~ and the first and the second through-channel meet each other and, forming a common through-channel, emerge laterally from the agitation system.

26. (Currently Amended) Agitation system according to ~~one of the claims claim 23 21 to 25~~, characterised in that two or more of the at least one of the first ~~and/or~~ and second through-channels are disposed along the circumference of the agitation system at a uniform spacing relative to each other.

27. (Currently Amended) Agitation system according to ~~one of the claims claim 22 21 to 26~~, characterised in that the basic body, in the cross-section perpendicular to the rotational axis, is circular cylindrical, elliptical, polygonal, square or rectangular.

28. (Currently Amended) Agitation system according to ~~one of the claims claim 21 to 27~~, characterised in that the basic body is oval, egg-shaped or cuboid.

29. (Currently Amended) Agitation system according to ~~one of the claims claim 21 to 28~~, characterised in that the basic body has recesses along its circumferential edge in the rotational direction.

30. (Currently Amended) Agitation system according to ~~one of the claims claim 1 to 20~~, characterised in that the agitation system ~~is configured according to one of the claims 21 to 29~~ has a basic body which, in operation, has

an upper side and an underside wherein in the basic body, at least one first through- channel is disposed, the first opening of which is situated at least partially on the underside of the basic body and the second opening of which is situated on at least one of the upper side and laterally on the basic body.

31. (Currently Amended) Arrangement for parallel, automated cultivation of cells in liquid columns on a millilitre scale, characterised by at least one device or agitation system according to ~~one of the preceding claims~~ claim 1.

32. (Currently Amended) Arrangement according to ~~the preceding~~ claim 31, characterised by a block, in which a number of cavities, which corresponds to the number of containers, are disposed, which represent containers themselves or are configured for receiving containers.

33. (Currently Amended) Arrangement according to ~~the preceding~~ claim 32, characterised in that the cavities are configured as borings with a diameter corresponding to the external diameter of the containers.

34. (Currently Amended) Arrangement according to ~~one of the two preceding claims~~ claim 32, characterised in that at least one of means for moderating the temperature of the block, means for driving the magnetic agitation system ~~and/or~~ and a sterile gas supply to the containers are disposed in the block.

35. Arrangement according to ~~one of the claims~~ claim 30 to 34, characterised in that at least one of the containers, the arrangement ~~and/or~~ and the block are sealed in a sterile manner on their or its upper side by means of a cover.

36. (Currently Amended) Arrangement according to ~~the preceding~~ claim 35, characterised in that the cover has an opening for the release of gases and as access to the interior of the container or block, which opening extends in a

straight line and longitudinally from the interior to the outer side of the cover and connects these together in an open manner for gas convection.

37. (Currently Amended) Arrangement according to ~~the preceding~~ claim 36, characterised in that, in the interior, a higher gas pressure is present than on the outer side of the cover.

38. (Currently Amended) Arrangement according to ~~one of the two preceding claims~~ claim 36, characterised in that the opening has the form of a boring or of a tube.

39. (Currently Amended) Arrangement according to ~~one of the three preceding claims~~ claim 36, characterised in that the opening has a clearance width, which makes possible the introduction of a sampling element or of a sensor, a pipette tip, a piercing cannula, a pH electrode or another object or elongated object into the interior of the container or block.

40. (Currently Amended) Arrangement according to ~~one of the claims~~ claim 36 to 39, characterised in that the opening is a tube made of metal or metal alloys, advantageously made of at least one of aluminum ~~and/or~~ and silver.

41. (Currently Amended) Arrangement according to ~~one of the claims~~ claim 36 to 40, characterised by container separating elements which, when in the state set upon the containers or the block, separate individual containers from each other in at least one of a gas- ~~and/or~~ and liquid-impermeable manner.

42. (Currently Amended) Arrangement according to ~~one of the claims~~ claim 36 to 41, characterised in that the cover has a sterile gas supply to the one or a plurality of containers, for all the containers together or for a plurality or each of the containers separately.

43. (Currently Amended) Arrangement according to ~~the preceding~~ claim 42, characterised in that the sterile gas supply has gas distributor structures which are integrated in the cover or disposed adjacent to the cover.

44. (Currently Amended) Arrangement according to ~~the preceding~~ claim 43, characterised in that channels are disposed in the cover as gas distributor structures.

45. (Currently Amended) Arrangement according to ~~the preceding~~ claim 44, characterised in that the channels between the gas inlet into the gas distributor structure and the gas outlets into the respective containers all have at least one of the same length and/or and the same number of bends.

46. (Currently Amended) Arrangement according to ~~one of the claims claim~~ 42 ~~41 to 45~~, characterised in that the gas supply is connected to a gas feed, if necessary via at least one of sterile filters ~~and/or and~~ air humidifiers.

47. (Currently Amended) Arrangement according to ~~one of the claims claim~~ 31 to 46, characterised in that the cover has at least one planar layer or flat plate, which covers the opening of the at least one container.

48. (Currently Amended) Arrangement according to the ~~preceding~~ claim 47, characterised in that it has at least two planar layers which are disposed parallel to each other and between which the gas distributor structures are disposed.

49. (Currently Amended) Method for cultivating cells in liquid columns on a millilitre scale, at least one cell suspension being moved in a container in such a manner that the cell suspension forms an annular flow,



characterised in that the flow velocity of the annular flow is modified at least one of locally and/or and temporally along a streamline.

50. (Currently Amended) Method according to ~~the preceding~~ claim 49, characterised in that at least one of the container ~~and/or and~~ the agitation system are configured in such a manner that conveyance of the culture suspension which is directed from the suspension surface to the base of the container is effected.

51. (Currently Amended) Method according to ~~one of the two preceding claims~~ claim 49, characterised in that the at least one cell suspension is cultivated in a device or arrangement according to one of the preceding claims by mixing with a an agitation system.

52. (Currently Amended) Method according to ~~the preceding~~ claim 51, characterised in that the agitation system is driven with 1 to 4000 revolutions per minute.

53. (Currently Amended) Method according to ~~one of the two preceding claims~~ claim 51, characterised in that the agitation system is driven with over 500 revolutions per minute.

54. (Currently Amended) Method according to the ~~preceding~~ claim 53, characterised in that the agitation system is driven with over 1000 revolutions per minute.